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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/839,763	04/20/2001	Kyle S. Leboutz	1382/005	1283

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EXAMINER

HASSANZADEH, PARVIZ

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 07/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Applicati n N .

09/839,763

Applicant(s)

LEBOUITZ ET AL.

Examiner

Parviz Hassanzadeh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-29, 31-71 is/are pending in the application.
- 4a) Of the above claim(s) 14-24, 36-38 and 45-71 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-13 is/are allowed.
- 6) ☒ Claim(s) 25-29, 31-35 and 39-44 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election of Species 6 of Group I, claims 1-13, 25-29, 31-35 and 39-44, in Paper No. 5 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claims 14-24, 36-38 and 45-71 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Species and method, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 5.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 25-29, 31-35 and 41-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over admitted prior art (Fig. 1, pages 1-6) in view of McQuarrie et al (US Patent No. 6,409,876 B1) and Nishikawa et al (US Patent No. 5,470,390).**

The admitted prior art (Fig. 1) teaches an etching apparatus comprising:  
an etching chamber for receiving a sample to be etched, wherein the etching chamber is in fluid communication with a roughing pump assembly;

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a source of etching gas which is generated from a non-gaseous material ( $\text{XeF}_2$ );  
an expansion chamber in selective fluid communication with the source of etching gas and the etching chamber. The apparatus further includes a source of mixing gas such as nitrogen in fluid communication with the expansion chamber.

The admitted prior art fails to teach the expansion chamber being in fluid communication with a vacuum pump.

McQuarrie et al teach an etching apparatus (Fig. 1) wherein an expansion chamber 12 is in fluid communication with a  $\text{XeF}_2$  source chamber 16, an etch chamber 11 and a roughing pump assembly 14 such that the expansion chamber may be evacuated either through the etching chamber or directly via a bypass 28 by a roughing pump (column 1, line 63 through column 2, line 47).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement the bypass mechanism as taught by McQuarrie et al in the apparatus of admitted prior art in order to be able to evacuate the content of the expansion chamber directly.

The admitted prior art further fails to teach a second expansion chamber in selective fluid communication with the source of etching gas and the etching chamber.

Nishikawa et al teach an apparatus (Figs. 3) for dynamic blending a semiconductor fluid ( $\text{SiH}_4$ ) with a carrier gas for use by a fabrication tool at the fabrication tool site, the apparatus comprising: a fluid blender system in which a semiconductor fluid feed line 5 is split into two flow trains 5 each being mixed with a carrier gas ( $\text{N}_2$ ) introduced from a line 19 in a mixing chamber 13 before entering a buffer tank 21, and wherein the mixed gas is delivered to a manufacturing unit 4, wherein one of the buffer tank 21 is used as a backup source and each

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having a valve 9D which can be opened or closed independently. (abstract and column 9, lines 48-60; column 3, line 60 through column 4, line 12).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide a backup gas source system as taught by Nishikawa et al in the apparatus of admitted prior art in view of McQuarrie et al in order maintain and introduce the same mixed gas from the expansion chamber into the etching chamber during processing by switching from a first expansion chamber into a second expansion chamber when there is a pressure drop in the first expansion chamber.

Furthermore, it is held *in re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960) that a mere duplication of parts has no patentable significance unless a new and unexpected result is produced therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to include additional expansion chamber in order to provide a backup gas source such that when one expansion chamber is exhausted, the second expansion chamber can be used while the first expansion chamber is refilled with etching gas and thus increasing the throughput of the system.

It is the Examiner's position that the automatic heating and control, load lock chamber, gas analysis, gas flow rate controller are well known in the art and modification of the admitted prior art to include such limitation would have been obvious to one of ordinary skill in the art at the time of the invention.

***Allowable Subject Matter***

Claims 1-13 are allowed.

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The following is a statement of reasons for the indication of allowable subject matter: an etching apparatus comprising: an etching chamber for receiving and etching a sample; a source of etching gas; and an expansion chamber being in selective fluid communication with the etching chamber and the source of etching gas,

wherein the expansion chamber is a collapsible, variable volume chamber..

Claims 39 and 40 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

### ***Response to Arguments***

Applicant's arguments with respect to claims 25-35 and 39-44 have been considered but are moot in view of the new ground(s) of rejection.

The Applicants assert that each expansion chamber is in fluid communication with a vacuum pump system directly.

The Examiner argues that McQuarrie et al as well as Patel et al teach an expansion chamber which is in direct communication with a vacuum pump system.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

*Patel et al (US Patent No. 6,290,864 B1)* teach an etching chamber including an expansion chamber having a larger volume than an etching chamber (Fig. 1), wherein the expansion chamber is in direct communication with a vacuum pump;

*RD-41537 (Research Disclosure, November 1998, pages 1465-1466)* teaches an automated back-up system for gas cabinet in semiconductor fabrication facility including three alarm conditions which automatically initiate cross over from primary to back-up in order to provide uninterrupted gas supply (see the entire document).

*Ishizawa et al (US Patent No. 6,328,864 B1)* teach a processing system (Fig. 4) including a plurality of gas loading chambers 204a-204c; and


*Winters (US Patent No. 4,190,488)* teaches an etching apparatus using  $\text{XeF}_2$  as a source of etching gas.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Parviz Hassanzadeh whose telephone number is (703)308-2050. The examiner can normally be reached on Tuesday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (703)308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9310 for regular communications and (703)872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0661.

  
Parviz Hassanzadeh  
Primary Examiner  
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July 15, 2003